

REMARKS

The Office Action mailed July 31, 2002, has been received and reviewed. Claims 1 through 41 are currently pending in the application. Claims 1-8 and 24-41 have been withdrawn from consideration as being drawn to a non-elected invention. Claims 9 through 23 stand rejected. Applicant has amended claims 9, 10, 14, 15, 18 and 20 through 22, and cancelled claims 1 through 8, 19 and 24 through 41 without prejudice or disclaimer. New claims 42 through 45 have been added. Reconsideration of the application as amended herein is respectfully requested.

35 U.S.C. § 112 Claim Rejections

Claim 14 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. While it is believed that claim 14 in its rejected form provides sufficient antecedent basis for the limitation of “said opposing surface”, in the interest of eliminating any confusion with respect thereto Applicant has amended claim 14 to recite the “aperture extends through said substrate and opens onto an opposing surface *of said substrate ...*” (emphasis added). Claim 18, which recites a limitation similar to that of claim 14, has also been amended to include this language. The amendments to the claims are not made for the purpose of narrowing the claims, but to more clearly recite the limitations of the claims. As such, Applicant respectfully asserts that no surrender or disclaimer of claim scope, and more specifically, of the broadest possible range of equivalents to which Applicant may be entitled has been effectuated.

In view of the foregoing, Applicant respectfully submits claim 14 is allowable under the provisions of 35 U.S.C. § 112, second paragraph, and requests that the rejection be withdrawn.

35 U.S.C. § 102(b) and (e) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 3,569,790 to Jenik

Claims 9 through 12, 14 through 16 and 18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jenik, (U.S. Patent No. 3,569,790). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Jenik discloses a plug in type connector for detachable connection of a conductor plate 5 carrying a plurality of micromodules 6 to a circuit plate 12 (Fig. 3 and col. 2, lines 69-73). The connector comprises bores lined with a metal coating 12a extending through circuit plate 12 and spring contact elements 11 positioned above circuit plate 12 for receiving contact pins 7 extending from conductor plate 5 (col. 3). In an alternative embodiment, a spring contact element 11' has an elongated end portion 13 which extends into an associated bore in the circuit plate (Fig. 4 and col. 4, lines 9-17).

Claim 9, as amended herein, recites the limitations of “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate”, “a spring contact including a base portion and a contact portion” and “an aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact.”

The corresponding bore structure in Jenik, on the other hand, is depicted as having a uniform tubular structure passing through circuit plate 12, and does not include a seat portion configured to at least partially contain a contact portion. Instead, spring contact elements 11 are positioned at a location *above the surface* of circuit plate 12. This is necessary to allow contact elements 11 to receive contact pins 7 while using housing 9 to hold pin-supporting board 8 and circuit plate 12 in a spaced relationship (Figs. 2-3 and col. 4, lines 17-26). Accordingly, claim 9 is allowable over Jenik, as it fails to describe all of the elements of claim 9.

Claims 10 through 12, 14 through 16 and 18 are also allowable, among other reasons, as depending from claim 9. Furthermore, amended claim 10 recites “wherein said second end of said retaining portion does not extend entirely through said substrate”, claim 12 recites “wherein said layer of conductive material is electrically connected to a conductive trace formed on said one surface of said substrate”, claim 14 recites “wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface of said substrate and said layer of conductive material is electrically connected to a conductive trace formed on said opposing surface of said substrate”, amended claim 15 recites “a volume of conductive filler material disposed in and filling at least a partial depth of said aperture and electrically contacting said base portion of said spring contact”, claim 16 recites “wherein said conductive filler material is electrically connected to a conductive trace formed on said one surface of said substrate” and claim 18 recites “wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface of said substrate and said conductive filler material is electrically connected to a conductive trace formed on said opposing surface of said substrate.” Jenik does not disclose these limitations, and claims 10, 12, 14 through 16 and 18 are allowable for that reason as well.

Anticipation Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al.

Claims 9 through 12, 14 through 16 and 18 through 22 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Haseyama et al. (U.S. Patent No. 6,229,320 B1). Applicant respectfully traverses this rejection, as hereinafter set forth.

Haseyama et al. discloses an IC socket 200 mounted on a test board 32 and having a contact unit 23 including a plurality of contact pins 30 for engaging solder bumps 28 on an IC device 25. Contact unit 23 may include various features such as elastic member 31, 31A, positioning plate 36 with recesses 38, positioning parts 52A, 53A or guide plates 41 and 42 for retaining contact pins 30 and positioning of solder bumps 28 (Figs. 7-19). Haseyama et al. further discloses that contact pins 30 may have a spiral part 63 for contacting solder bumps 28 (Figs. 21A-21B and col. 15, lines 31-53). The opposite ends of contact pins 30 pass out of the underside of the socket body 21 and are configured to connect to land parts 33 on test board 32, or in the alternative, to have elastically deformable parts 71, 72, 73 inserted into through holes 70 in test board 32.

Claim 9, as amended herein, recites the limitations of "a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate", "a spring contact including a base portion and a contact portion" and "an aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact."

Applicant respectfully submits that Haseyama et al. does not describe these limitations. Rather than a substrate configured to operably connect the IC device to other IC devices or electrical components mounted on the substrate, the structure in Haseyama et al. cited by the Office comprises a socket 200 intended for mounting to a test board 32. Further, while the

aperture structure for containing the spring contacts is formed directly in the substrate of Applicant's claimed invention, the contacts of Haseyama et al. are substantially contained by the multiple parts of socket 200. Thus, wherein Applicant's invention provides for directly attaching the IC device to a substrate, the invention of Haseyama et al. requires additional socket structure that adds cost and complicates assembly. Finally, the instant rejection combines various features from the different alternative embodiments disclosed by Haseyama et al., without the cited reference itself describing this combination. Applicant respectfully submits that, in this instance, the Office has improperly relied upon hindsight in an attempt to piece together the subject matter required by applicant's claims. The Federal Circuit has repeatedly cautioned against employing hindsight by using the Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teaching of the prior art. See, e.g., *Grain Processing Corp. v. American-Maize Prods. Co.*, 5 U.S.P.Q.2d 1788, 1792 (Fed. Cir. 1988).

In view of these clear structural and functional differences between the claimed invention and that disclosed by Haseyama et al., Applicant respectfully submits claim 9 is allowable under the provisions of 35 U.S.C. § 102(e).

Claims 10 through 12, 14 through 16 and 18 through 22 are also allowable, among other reasons, as depending from claim 9. Furthermore, amended claim 10 recites "wherein said second end of said retaining portion does not extend entirely through said substrate", claim 11 recites "a layer of conductive material disposed on at least a portion of an interior wall of said aperture, said layer of conductive material electrically contacting said base portion of said spring contact", claim 12 recites "wherein said layer of conductive material is electrically connected to a conductive trace formed on said one surface of said substrate", claim 14 recites "wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface of said substrate and said layer of conductive material is electrically connected to a conductive trace formed on said opposing surface of said substrate", amended claim 15 recites "a volume of conductive filler material disposed in and filling at least a partial depth of said aperture and electrically contacting said base portion of said spring contact", claim 16 recites

“wherein said conductive filler material is electrically connected to a conductive trace formed on said one surface of said substrate” and claim 18 recites “wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface of said substrate and said conductive filler material is electrically connected to a conductive trace formed on said opposing surface of said substrate.” Haseyama et al. does not disclose these limitations, and claims 10 through 12, 14 through 16 and 18 are allowable for that reason as well.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al.

Claims 13 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320 B1) in view of Tanaka (Patent Application Publication US 2002/0075025 A1). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

The 35 U.S.C. § 103(a) obviousness rejections of claims 13 and 17 are improper because they fail to establish a *prima facie* case of obviousness.

Tanaka teaches a semiconductor testing tool having a socket casing 2 with internal lead wires 8 (Figs. 1 and 3). The internal lead wires 8 are assertedly obvious to combine with the substrate of Haseyama et al. to beneficially reduce the number of structural elements of the test tool.

Claims 13 and 17 depend from claim 9. Claim 9, as amended herein, recites the limitations of “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate”, “a spring contact including a base portion and a contact portion” and “an aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact.”

For the same reasons as described above, neither Haseyama et al. nor Tanaka, alone or as combined, teach these limitations. Accordingly, claim 9 is allowable over the cited references under the provisions of 35 U.S.C. § 103(a). The nonobviousness of independent claim 9 precludes a rejection of claims 13 and 17 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. See *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejections to claims 13 and 17.

Obviousness Rejection Based on U.S. Patent No. 6,229,320 B1 to Haseyama et al.

Claim 23 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Haseyama et al. (U.S. Patent No. 6,229,320 B1) in view of Kawaguchi (JP 2000-123935). Applicant respectfully traverses this rejection, as hereinafter set forth.

The 35 U.S.C. § 103(a) obviousness rejection of claim 23 is improper because it fails to establish a *prima facie* case of obviousness.

Kawaguchi teaches a test socket 1 for electronic parts having contact pins 20 with spiral coil springs 20a having two or more coil turns (see Abstract). The Office indicates it would be

obvious to use two or more coil turns for the spring contacts of Haseyama et al. to prevent damage and provide better contact with the solder bumps.

Claim 23 depends from claim 9. Claim 9, as amended herein, recites the limitations of “a substrate configured for operably connecting said IC device to at least one other IC device mounted on said substrate or at least one electrical component mounted on said substrate”, “a spring contact including a base portion and a contact portion” and “an aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact.”

For the same reasons as described above, neither Haseyama et al. nor Kawaguchi, alone or as combined, teach these limitations. Accordingly, claim 9 is allowable over the cited references under the provisions of 35 U.S.C. § 103(a). The nonobviousness of independent claim 9 precludes a rejection of claim 23 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. See *In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), see also MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to claim 23.

Drawings

Applicant submits herewith, under cover of a separate Letter to the Official Draftsperson, proposed corrections to FIGS. 1 and 2 of the drawings. Specifically, a legend has been added to each of FIGS. 1 and 2 designating them as “Prior Art”

All proposed corrections have been marked in red. Applicant respectfully requests approval of the corrections to the drawings. Applicant will submit formal drawings upon Notice of Allowance.

ENTRY OF AMENDMENTS

The amendments to claims 9, 10, 14, 15, 18 and 20 through 22 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application.

CONCLUSION

Claims 9 through 18, 20 through 23 and 42 through 45 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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Enclosure: Version With Markings to Show Changes Made

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VERSION OF CLAIMS WITH MARKINGS TO SHOW CHANGES MADE

9. (Amended) A device for establishing electrical contact [between] with a lead element extending from an IC device [and a substrate], comprising:
a substrate configured for operably connecting said IC device to at least one other IC device
mounted on said substrate or at least one electrical component mounted on said substrate;
a spring contact including a base portion and a contact portion, said contact portion comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element of said IC device; and
an aperture including a seat portion opening onto one surface of said substrate and a retaining portion having a first end connected to an opposing end of said seat portion and a second end extending a depth at least partially into said substrate, said seat portion of said aperture configured to at least partially contain said contact portion of said spring contact and said retaining portion of said aperture configured to receive and electrically contact said base portion of said spring contact.

10. (Amended) The device of claim 9, wherein said second end of said retaining portion does not extend entirely [aperture extending] through said substrate [and opening onto an opposing surface thereof].

14. (Amended) The device of claim 11, wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface [thereof] of said substrate and said layer of conductive material is electrically connected to a conductive trace formed on said opposing surface of said substrate.

15. (Amended) The device of claim 9, further comprising a volume of conductive filler material disposed in and filling at least a partial depth of said aperture and electrically contacting said base portion of said spring contact.

18. (Amended) The device of claim 15, wherein said retaining portion of said aperture extends through said substrate and opens onto an opposing surface [thereof] of said substrate and said conductive filler material is electrically connected to a conductive trace formed on said opposing surface of said substrate.

20. (Amended) The device of claim 2 [19], said second end of said retaining portion opening onto an opposing surface of said substrate.

21. (Amended) The device of claim 2 [19], wherein said seat portion comprises a generally hemispherical recess formed in said one surface of said substrate, a generally conical recess formed in said one surface of said substrate, or a generally cylindrical recess formed in said one surface of said substrate.

22. (Amended) The device of claim 2 [19], wherein said seat portion is further configured to at least partially align said lead element of said IC device relative to said spring contact.